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Oncogeriatrics (part 6.)

The usefulness of routine preoperative investigations in the qualification of an older patient for elective surgery

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Medical history, physical examination and a Comprehensive Geriatric Assessment remain the most important elements in preparing an older patient for surgery, to determine the number of preoperative additional tests, and remain the strongest predictors of postoperative outcome. The additional 40-60 minutes devoted to its implementation at the time of qualification for surgery, is well worth the chance to significantly reduce the risk of complications in the postoperative period. The patient's chronological age alone is not a criterion for the type and number of additional tests. Routine biochemical blood serum tests (with the exceptions of haemoglobin, creatinine, albumin and HbA1c in diabetic patients) and other preoperative static investigations have not been shown to affect the risk of postoperative complications, no more so in the older population. It is also misleading to believe that a large number of preoperative tests will protect the attending physician from legal liability.

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Advances in medicine and other areas of life have caused the number of people over 80 years old to increase by 70% over the past few decades. Elderly patients account for half of the adults operated on, but about 80% of peri- and postoperative complications are in this age group [1]. As a result, the costs of preoperative diagnostics and treatment is increasing significantly; therefore we should use our resources wisely.

All the below recommendations are based on the guidelines of scientific societies, supplemented, whenever possible, with studies on older surgical patients [2–5].

Preoperative investigations are used to detect disorders in asymptomatic patients in order to prevent unexpected problems. Many surveys conducted among physicians show that additional tests are very often performed without indications, or if they are already carried out, have no effect on patient management [6]. In this context, it is also interesting to observe the results of the study "Less is more" by Wijeysunder et al., in which 100,000 patients, who underwent internal consultation with various medical implications, were included in the study. The authors observed that there was a perceived necessity to perform further, often unnecessary tests, thereby changing the date of surgery and, what is more, increasing the 30-day risk of death related to the explanatory procedures carried out [7]. Furthermore, in the Ramesh B et al. study, including 300 people >65 years old, operated on due to oncological reasons, only 12.7% of patients had abnormalities in routine biochemical

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blood tests. There was also no significant connection between these abnormalities and increased risk of postoperative complications [8].

Therefore, any decision regarding the necessary biochemical tests, imaging and consultations should be made individually, taking into consideration the patient's current general condition, comorbidities and estimated surgical risk, which is an indicator of the 30-day risk of death due to cardiovascular reasons resulting only from the type of surgery, and excluding the patient's associated diseases (tab. I).

For elective surgery, pre-operative assessment and testing should be done early enough to clear potential abnormalities. It is currently accepted that this time should not be longer than 6 weeks from the date of the planned surgery [5].

A properly taken medical history, physical examination and Comprehensive Geriatric Assessment remain the most important elements in preparing an older patient for elective surgery and determining the number of additional tests it is necessary to perform. Unfortunately, as shown in surveys conducted among physicians, a detailed medical history and full physical examination is rarely carried out at the time of qualification [8].

In the older population, there are common abnormalities in the results of laboratory tests that do not change preoperative procedures in any way and, more importantly, do not correlate with the frequency of postoperative complications, even in the oldest age groups (80–100 years). Therefore, age alone should not determine the need for routine biochemical testing of these patients [6].

A complete blood count should be performed in ASA patients scored 1–4 before each high-risk procedure and should be considered in patients with ASA 3–4 who have qualified for intermediate risk surgery with known cardiovascular and/or renal disease, if they have previously undiagnosed symptoms. In all other cases, a complete blood count is not routinely recommended [2].

Electrolytes, urea and creatinine should be performed in patients with ASA scored 1–4 who have qualified for high risk procedures, ASA 3–4 in all types of surgery and if the patient is taking diuretics, is diagnosed with chronic kidney disease, diabetes or when preparing the patient for surgery may change their value significantly (preoperative bowel preparation). However, it should also be stressed that the determination of serum creatinine is of great value in identifying patients with cardiac risk. Serum creatinine >170 mmol/l or >2 mg/dl or creatinine clearance <60 ml/min/1.73m^2 is one of the six independent risk factors for perioperative cardiac complications [9].

In all older patients, pre-operative fasting blood sugar measurement should be performed. This will detect previously unknown or incorrectly treated diabetes or impaired glucose tolerance, which significantly correlates with the risk of postoperative complications. The determination of glycated hemoglobin (HbA1c) is recommended in patients with diagnosed diabetes who have not had it checked in the last 3 months [2].

Levels of alanine transaminase and aspartate transaminase are not routinely recommended but should only be performed for patients with suspected or diagnosed liver and biliary tract disease. It has also been shown that asymptomatic abnormalities in liver enzyme results do not change the perioperative management and are not prognostic in postoperative course. Patients with liver cirrhosis have a significantly increased risk of death and postoperative complications. However, this risk is proportional to the severity of liver cirrhosis measured by the Childs-Pugh classification, and not to the level of the above-mentioned enzymes [10, 11].

It is advisable to check the level of serum albumin concentration in all elderly patients qualified for high risk surgery. Preoperative albumin concentration is one of the most important indicators of perioperative risk of complications and death (this correlation is linear and becomes statistically significant at serum albumin <3.5g /dl). In patients scheduled for elective surgery, hypoalbuminaemia, with clinical compliance, is most often symptomatic of malnutrition. This condition significantly increases the risk of postoperative complications and requires nutritional treatment and postponement of elective surgery according to the guidelines [12].

There is no indication for the routine monitoring of coagulation parameters in all patients. This is due to the fact that

Table I. Estimated 30-day risk of death from cardiovascular causes resulting from the type of surgery without taking into account the patient's accompanying diseases [5]

Low risk <1%	Intermediate risk 1–5%	High risk >5%
– Superficial skin and subcutaneous tissue operations – Thyroid surgery – Breast surgery – Minor urological procedures, including transurethral procedures – Minor gynecological procedures – Minor orthopedic procedures – Cervical vascular surgery in asymptomatic patients	– Cholecystectomy, splenectomy, hiatal hernia surgery – Major urological (except bladder resection) and gynecological procedures – Major orthopedic procedures – Cervical vessels treatment in symptomatic patients – Endovascular procedures (including aortic aneurysm) – Minor thoracic surgery – Kidney transplantation	– Oesophageal, duodenal, pancreatic, biliary and liver surgery – Colorectal surgery – Adrenal resection – Total bladder resection – Open limb vascular procedures – Major thoracic surgery – Lung/liver transplantation

activated partial thromboplastin time, normalized prothrombin time and platelet count do not allow the detection of the most common abnormalities. A detailed history (regarding bleeding disorders in the past, epistaxis, intra-articular and soft tissue bleeding, prolonged bleeding after tooth extraction, excessive bleeding during menstruation, family history regarding such disorders, medications taken) is more sensitive and specific than the routine tests mentioned above, a fact which has been confirmed in studies involving very large groups of surgical patients. Therefore, coagulation parameters should be determined when the patient has a positive history in the aforementioned abnormalities and in patients with ASA scored 3–4 with chronic liver disease undergoing intermediate- or high-risk surgery. If the patient is taking novel oral anticoagulants, however, there are currently no simple tests to assess the coagulation system [13].

Thyroid stimulating hormone (TSH) level should be performed on all patients qualified for intermediate- and high-risk operations. Some studies have identified this parameter, along with complete blood count, as one of the most common abnormalities occurring in the older population [8]. In oncological patients, most often the level of the TSH in blood serum is taken before computed tomography.

It is not recommended to routinely perform a urinalysis prior to surgery except for patients with dysuric symptoms or when it is necessary to determine the baseline status before urological and orthopedic surgery. Artetial blood gas analysis is not routinely recommended for patients qualified for elective surgery [4].

Performing a pre-operative electrocardiogram (ECG) at rest is recommended for asymptomatic patients who have qualified for high-risk surgery, patients with more than one cardiac risk factor (coronary heart disease, heart failure, stroke or transient ischemic attack of the central nervous system, renal dysfunction, diabetes requiring treatment with insulin), and in the case of patients with ASA 3–4 also for low-risk procedures. An ECG at rest does not provide additional information when used as a screening method in elderly patients. Cardiac echocardiography should be performed on all patients with recently detected heart murmurs, dyspnoea, syncope and heart failure symptoms. The results of resting echocardiography do not correlate with perioperative cardiovascular complications. Echocardiography may be considered in patients with no clinical symptoms, with no ECG changes, who are undergoing high-risk procedures [14, 15].

A chest X-ray is not recommended as a routine pre-operative examination because it has very limited value. The procedure is recommended only if the result may have an impact on the change in perioperative management (pneumonia, suspected anatomical abnormalities). The sensitivity of this test in heart disease is low and rarely effects a change in perioperative management, which is why it is not recommended as a routine test [16].

Spirometry is not routinely recommended for patients qualified for elective surgery except patients with ASA 3 and 4 with suspected or known respiratory disease and who are eligible for high risk surgery [17].

Indications for coronary angiography are based on an evaluation algorithm that takes into account the following data: the urgency of the operation, the patient's clinical stability, the cardiac risk of the operation, the patient's performance, clinical cardiac risk factors and the level of induced ischemia. A detailed description of the algorithm is available on the website of the Polish and European Society of Cardiology.

The patient's chronological age alone is not a criterion for the type and number of additional tests. Routine biochemical blood serum tests (except for haemoglobin, creatinine, albumin and HbA1c in diabetic patients) and other preoperative investigations have not been shown to affect the risk of postoperative complications in the older population. The key is a proper medical history and physical examination, extended by the Comprehensive Geriatric Assessment. In our opinion, the 40–60 minutes devoted before surgery to its implementation, is well worth the chance of significantly reducing the risk of complications in the postoperative period, which are often associated in the case of elderly people with prolonged hospitalization, the risk of disability, dependence on the care of others, and an increased risk of death, not to mention the costs. It is also misleading to believe that a large number of preoperative tests will protect the attending physician from legal liability.

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